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ABSTRACT

The recent movement to restructure schools has raised fundamental questions: Can changes in school structure improve student performance? Under what conditions might some structures be more effective than others? This document presents findings from Lee and Smith's study that examined the role of school restructuring on student performance. Methodology was based on an analysis of data collected as part of the National Education Longitudinal Study (NELS) in 1988 and 1990. The standardized test scores of 11,794 students in mathematics, reading, social studies, and science were traced as they moved from grades 8 to 10. Information about the schools' reform efforts was used to classify the schools as traditional, moderate, or restructuring. Findings indicate that not only were student achievement gains in the first 2 years of high school significantly higher in the restructured schools than in the traditional schools, but those gains were also distributed more equitably. Students in the restructured schools learned more, as indicated by test results, and were more engaged than their counterparts. Students in smaller high schools made greater gains in academic performance in all four areas, and those gains were more equitably distributed across the student body. The results lend support to the communal, rather than bureaucratic, school model. The document includes commentaries by two academic researchers--Anthony S. Bryk and Milbrey W. McLaughlin--and an article by Leon Lynn, who presents interpretations of Lee and Smith's study by three experienced high school principals. Finally, comments are offered by the director and associate director of the Center on Organization and Restructuring of Schools. Three figures are included. (LMI)

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Issues in restructuring schools

High School Restructuring and Student Achievement

A New Study Finds Strong Links

By Valerie E. Lee and Julia B. Smith

The recent movement to restructure schools has raised fundamental questions: Can changes in school structure improve student performance? Under what conditions might some structures be more effective than others?

In this issue report, we present compelling evidence that restructuring high schools can indeed make a difference for students. This analysis, using data on more than 11,000 students enrolled in 820 high schools nationwide, shows clear links between school restructuring and improved student learning.

Although the study has not been able to show how or why these links occur, it offers solid evidence that students learn more in restructuring schools. We think the findings might be explained through the contrast between schools that are organized bureaucratically and schools that are organized communally.[1]

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Bureaucratic Schools

Educators in the United States, especially since the 1950s, have viewed large, comprehensive high schools as the best places to teach and socialize youth. Big schools have been seen as creating economies of scale and offering students a broader choice of courses and activities, as well as more resources. They were meant to offer something for everyone–but not the same something. This array of choices, and better matching of coursework to student interests, were widely assumed to lead to a better education.

Large U.S. high schools typically are organized under a "bureaucratic" structure. The structure is headed by an executive–the school principal–and is based on specialization: many different departments and programs, each serving special needs. Students choose a variety of courses designed to serve their specific abilities, interests and skills.

The typical large, comprehensive school does indeed offer an impressive array of educational opportunities. But there are hidden costs.

Often the array of courses and choices tends to stratify the student body into high-track and low-track students, with lower expectations for those in the lower-track classes. Less advantaged students (economically, socially and academically) tend to end up in less demanding courses. Over time, this increases the educational differences between students.

In this kind of school, teachers and students do not spend sustained time together working on common goals, so they do not get to know each other well. And given the typical high school's large size and emphasis on specialization, the number of different and possibly conflicting goals held by different people within the school increases.

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The array of courses and choices offered by a large, comprehensive high school tends to stratify the student body into high-track and low-track students, with lower expectations for those in the lower-track classes. Students who are less advantaged–economically, socially and academically–tend to end up in less demanding courses.

Valerie E. Lee is an associate professor of education at the University of Michigan, where she teaches courses in educational foundations and research methods. Her major research interests focus on educational equity and the effects of educational reforms on students.

Julia B. Smith is an assistant professor of educational organization and administration at the Warner School of Education and Human Development at the University of Rochester. She researches the effects of school organizational characteristics on teachers, students and administrators.

Large size and fragmented human contact complicate the management of such schools, which elevates the importance of formal rules to regulate behavior. The environment in comprehensive high schools is therefore less human.

Communal Schools

To counter the problems of bureaucracy, many educators and reformers are moving toward support for a "communal" model of school structure.

This form seems reminiscent of schools from an earlier time. In communal organizations, school members (both teachers and students) pursue common activities and get to know each other well. Complicated rules and procedures are less necessary, because the school setting is smaller, contact between people is more sustained and more personal, and there is more agreement on organizational purpose for which people share responsibility.

In a communally organized school, teachers work collaboratively, often in teams that are formed across subjects. Instead of being governed by top-down directives, teachers have more input into decisions affecting their work. And instead of slotting students into different educational paths, a communal school would group students of diverse talents and interests together for instruction.

In short, in a communal school the educational focus for students and teachers seems clearer to those who experience it, and the increased opportunity for sustained contact in groups may heighten the commitment of both teachers and students to succeed. Schools with this form have more meaning for their members.

Research Questions

While it's not hard to see why teachers might favor the communal model, with its promise of greater teacher autonomy and collaboration, a central question remains: Would students learn more in a school organized along communal lines?

Restructuring initiatives at the high school level in the United States are quite diverse. There is no consensus on a basic definition, nor is there a consensus, or any evidence, suggesting which organizational changes are most likely to boost student achievement.

With this in mind, we began by examining different reform practices in U.S. high schools

Instead of slotting students into different educational paths, a communal school would group students of diverse talents and interests together for instruction.

that were surveyed as part of the data collection known as the National Education Longitudinal Study, or NELS (a complete list of the practices that were examined in our study is included in Figure 1).

We first distinguished between the practices that were the most significant departures from conventional practice, and those that were more familiar reforms. The "significant departure" criteria are consistent with criteria for school restructuring developed by the Center on Organization and Restructuring of Schools.[2] These reforms also represent a movement away from bureaucratically organized high schools and toward a more communal structure.

As one might expect, the high schools in the survey tended to report adopting the practices we saw as significant departures from conventional practice less often (as indicated by the frequency rates for each practice listed in Figure 1).

We hypothesized that the more significant departures from typical practice were more likely to improve student achievement and engagement; not simply because they were more radical, but also because they seemed also to represent an important shift in high school organization from a bureaucratic model to a communal model. Other studies also have suggested that students were more engaged in such schools.[3]

We also hypothesized that the restructuring schools would be more equitable; that is, gains would be spread more evenly among students with different socioeconomic backgrounds.

Finally, since it is easier to develop communal organization in smaller schools, we hypothesized that students would learn more in smaller schools, and that their academic success also would be more equitably distributed within the student population of smaller schools.

A summary of the research methods and data set can be found in the sidebar article on page 16.

Frequency of Restructuring

We chose to define as "restructuring" any high school that reported having in place three or more of the 12 practices we consider significant departures from conventional practice. About 46 percent of the high schools reported that they engaged in at least three of those practices. Schools with "restructuring practices" in place were likely to adopt more than one, along with many other practices that we classified as traditional or moderate.

As the number of restructuring practices being tried at the same time increased, however, the number of schools decreased. This suggests that numerous diverse restructuring practices are difficult to sustain at the same time.

We were surprised to find that about 12 percent of the 820 high schools in our study reported engaging in none of the 30 reform practices we examined. About 42 percent of the high schools reported that they tried at least one of the practices we have labeled as "moderate" or "traditional," without engaging in at least three of the practices we describe as "restructuring." In our analysis, we combined these schools in one category, which we labeled "traditional."

To examine the possible effects of restructuring practices, we considered the traditionally reformed schools as a base. The findings indicate how both the restructuring schools and the unrestructured schools compare to these traditional schools.

When studying student performance at the different types of schools, we filtered out the effects of differences in schools' academic and social character, as well as the academic and social characteristics of the students.

Links to Student Outcomes

The findings support all of our hypotheses about the effects of school restructuring on student outcomes.

Not only were student achievement gains in the first two years of high school significantly higher in the

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Figure 1

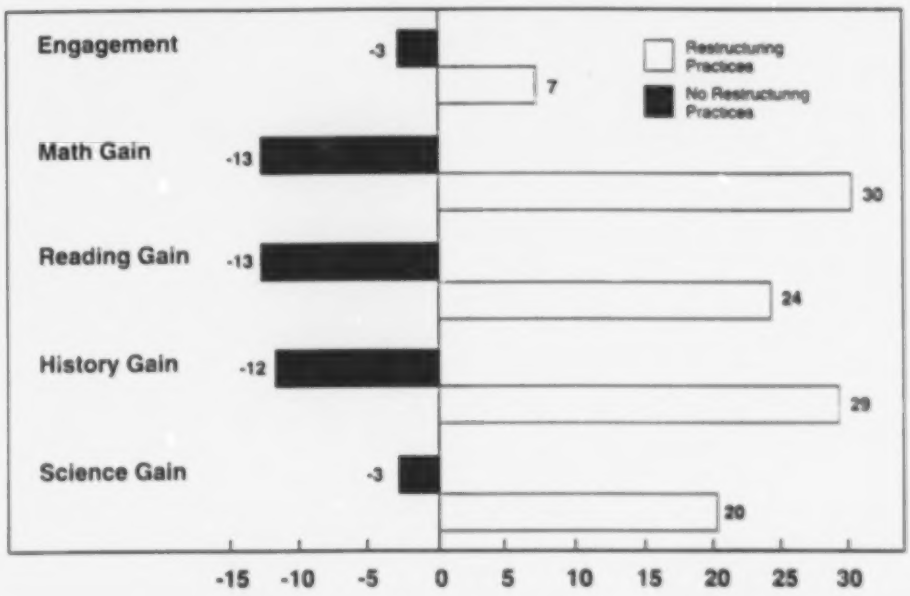
Frequency of Structural Practices in the 820 Secondary Schools Studied, Classified as Traditional, Moderate, and Restructuring

Structural Practice	Probability
Traditional Practices	
Departmentalization with chairs	.85
Common classes for same curricular track	.76
Staff development focusing on adolescents	.66
PTA or PTO	.64
Parent-teacher conferences each semester	.64
Focus on critical thinking in curriculum	.64
Common classes for different curricular tracks	.62
Increased graduation requirements	.62
Recognition program for good teaching	.56
Parents sent information on how to help kids study	.56
Moderate Practices	
Parent workshops on adolescent problems	.46
Student satisfaction with courses important	.42
Strong emphasis on parental involvement	.38
Strong emphasis on increasing academic requirements	.35
Student evaluation of course content important	.35
Outstanding teachers are recognized	.34
Emphasis on staff stability	.34
Emphasis on staff development activities	.32
Restructuring Practices	
Students keep same homeroom throughout HS	.30
Emphasis on staff solving school problems	.29
Parents volunteer in the school	.28
Interdisciplinary teaching teams	.24
Independent study, English/social studies	.23
Mixed-ability classes in math/science	.21
Cooperative learning focus	.21
Student evaluation of teachers important	.20
Independent study in math/science	.18
School-within-a-school	.15
Teacher teams have common planning time	.11
Flexible time for classes	.09

Each figure in the "probability" column represents the probability that an average high school (one which reports that it has adopted 11 to 13 of the 30 reform practices listed here) engages in each practice.

High School Restructuring and Student Achievement– Study Findings

Percent Gain in Student Engagement and Achievement for Schools with Different Types of Practices (Compared to Schools with Traditional Reform Practices)



These figures illustrate the increased gains in student engagement and academic performance, as well as the degree of equity, found in schools with restructuring practices, compared to schools with traditional restructuring practices and schools with no restructuring practices.

The comparisons are based on test scores and survey answers collected as part of National Education Longitudinal Study (NELS) in 1988.

Figure 2 compares the performance gains of students from 8th grade to 10th grade in traditionally restructured schools with student gains in the other two types of schools. Even though students in traditionally restructured schools did achieve academic gains from 8th grade to 10th grade, this chart represents progress in the other two types of schools by using the traditional schools' gains as a baseline score of 0.

In engagement and every subject area, students attending schools with restructuring practices showed greater gains than students in traditionally restructured schools. Schools with no restructuring practices, on the other hand, showed less improvement than students from either traditionally restructured schools or schools with restructuring practices.

Under engagement, for example, students attending schools with restructuring practices achieved gains that were 7 percent higher than the gains achieved by students in traditionally restructured schools, according to the survey data. Students in schools with no restructuring practices achieved gains that were 3 percent lower.

Figure 3 illustrates the different levels of equity observed in the three different types of schools. According to this analysis, the most equitable schools are those in which the gap in achievement between students of high and low socioeconomic status (SES) is the smallest.

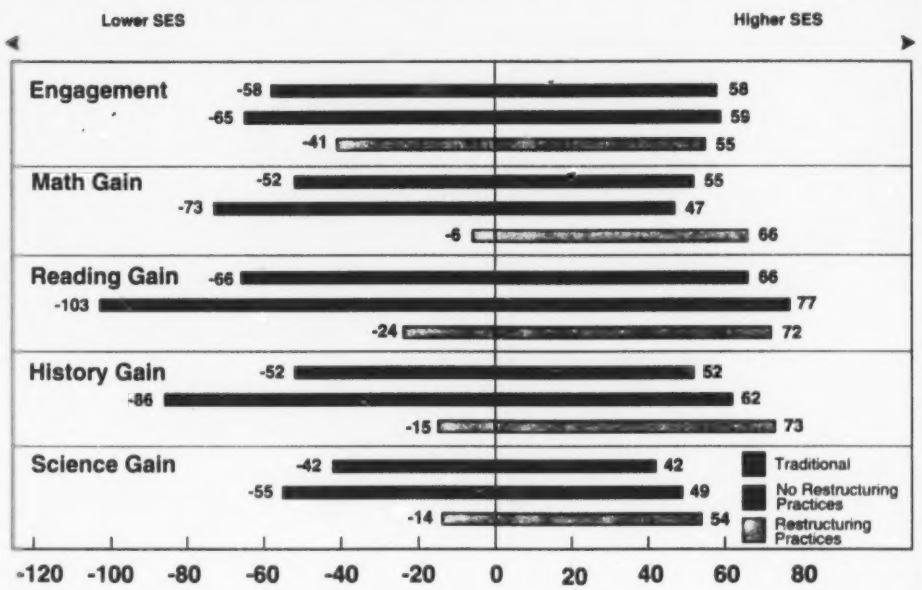
In all types of schools, students of higher SES generally achieved greater gains in academics and engagement than students of lower SES. Each bar on Figure 3 represents the difference in gain achieved by students of high and low SES. The baseline for this comparison is the average gain achieved by middle-income students in traditionally restructured schools.

Each bar shows the difference in gain from 8th grade to 10th grade for students of low SES (to the far left of the 0 line) and students of high SES (to the far right). For example, under engagement in traditionally restructured schools, the lowest SES students achieved gains that were 58 percent lower than the average gain for middle-income students, while the highest SES students achieved scores that were 58 percent higher.

These data show that the gap between highest and lowest SES students was consistently smaller in schools with restructuring practices than in the other two types of schools. Traditionally restructured schools, however, had narrower gaps than schools with no restructuring practices.

Figure 3

Percent Gain in Engagement and Achievement for Students of Different Social Class within Schools with Different Types of Practices



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restructuring schools than in the traditional schools, but those gains also were distributed more equitably. That is, the achievement gap between students of lower socioeconomic status, or SES, and students of higher SES was narrower in restructured schools.

Figure 2 presents the gains in academic subjects and engagement made by students in all three types of high schools we studied. The table shows that students in restructuring schools learned more, as indicated by test results, and were more engaged than their counterparts in either traditional or unrestructured schools. These results held true for students in all socio-economic groups.

Figure 3 shows the range of performance gains, in academic subjects as well as engagement, between students of low SES and students of high SES in each type of school. While students from higher SES groups gained more in all three types of schools, the difference in gains between high and low SES students is clearly smaller in restructuring schools. Traditional schools posted smaller gaps than unrestructured schools, but they still fell short of the equity achieved by restructuring schools.

Within the restructuring group of schools, however, we found that schools that reported trying many restructuring reforms at once–more than three of the 12 practices we defined as restructuring reforms–showed less of an advantage in gains and a less equitable distribution of gains.

Significantly, we also found that students who attended smaller high schools consistently posted higher gains in all four cognitive areas. Further, those gains were more equitably distributed across the student body. These gains in smaller schools were above and beyond the restructuring effects discussed earlier.

Implications

The advantages to students in restructuring high schools and smaller high schools–both in terms of academic learning and social equity–lend support to the move toward the communal organizational model, and away from the bureaucratic model of the comprehensive U.S. high school. But this note of optimism must be tempered by important qualifications.

We are not suggesting that a school can boost student performance merely by implementing any three items from the list of restructuring reforms cited here. The findings above do not explain how specific restructuring elements are implemented to make the organization function better. The process of change in the structure of a high school is too complicated for such pat answers.

Unfortunately, the data we used included no indicators of how pervasively or vigorously the restructuring practices were pursued by the schools adopting them, how many students and/or teachers took part in reforms, how the practices were connected to classroom instruction, or even when the practices were implemented. For all we know, the practices may not represent significant change in any of the "restructuring" schools. Many of these schools might have had these practices in place for years.

Also, these results considered student learning only for the first two years of high school. We plan to continue investigating the schools and

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COMMENTARIES–

Different Perspectives on the Lee and Smith Study

The Center on Organization and Restructuring of Schools invited several commentators to review the Lee and Smith study and offer interpretations of the results and what they mean.

We begin with two perspectives from distinguished academic researchers, who were asked to comment on why the schools with "restructuring practices" might be so successful at enhancing student achievement and equity, and what implications the findings might have for high schools in general.

We then hear from three experienced high-school principals, who suggest what the Lee and Smith study might mean for educators on the "front line" of U.S. high schools.

Finally, the director and associate director of the Center offer some thoughts on the important questions raised by the study, and how they might be pursued.

MORE GOOD NEWS THAT SCHOOL ORGANIZATION MATTERS

By Anthony S. Bryk

Promoting greater equality of educational attainment has been a major educational policy initiative for several decades. Research in the early 1980s reported that Catholic high schools were especially effective in this regard. The background characteristics that students brought to Catholic schools, such as family income and parental education level, played much less of a role in subsequent achievement than they did in comparable public schools.

Here, apparently, were a set of schools, about which we knew relatively little, that seemed to be doing something right. Understanding better how these schools were organized to achieve these desirable outcomes was the primary motivating factor in our almost decade-long study of these schools.[1]

As this research proceeded, we gradually came to realize that organizing schools to produce relatively high levels of achievement for a broad cross-section of students is not a simple task. Rather it entails a subtle melding of both academic and social concerns.

Schools organized to produce a more equitable distribution of achievement tend to have focused academic programs that place significant learning demands on all students, regardless of background. This distinctive academic organization is embedded within a larger social environment that encourages a high degree of personalism among both teachers and students. The schools are smaller, affording more opportunities for all participants to really know each other. Faculty roles are less specialized, encouraging greater cooperative work with colleagues and more extensive and varied opportunities for interactions with students. And at base is a broadly shared set of beliefs about what students should learn, how both adults and students should behave, and the school's purpose to fully educate all students. In such contexts, we find very high levels of both teacher commitment and student engagement.

Now, we see that new research, which began with a very different aim, reports very complementary findings. The study by Lee and Smith highlighted in this issue report uses a new large national data set (the National Education Longitudinal Study, or NELS), focuses on a different grade span (from 8 to 10, as contrasted with earlier work by researchers on grades 10 to 12), and gives special attention to public schools with at least some of the distinctive restructuring practices being investigated by the Center on Organization and Restructuring of Schools.

Yet, the results are quite similar to our earlier findings from effective Catholic high schools: In schools where recommended restructuring practices are commonplace, higher levels of student engagement in schooling, greater gains in achievement and a more equitable social distribution of that achievement occur.

Interpreting the Findings

It is important to emphasize that Lee and Smith were unable to identify any distinctive subsets among their "restruc-

turing practices" that were especially effective. This suggests that the individual restructuring practices culled from NELS may not be as important, per se, as the larger organizational phenomena that they indicate or point toward. That is, schools reporting extensive restructuring practices are likely to be fundamentally different organizational environments. The practices mentioned in NELS, therefore, should not be read literally as a list of ingredients or a recipe to follow. In fact, they are almost surely not that.

Such a conclusion is similar to that reached by Chubb and Moe, who argue that good schools have an "effective organizational syndrome,"[2] and by Bryk and Driscoll, who claim that such schools are "communally organized."[3] This interpretation by no means diminishes the importance of the "restructuring practices" that were the prime focus for this research. However, it does serve to remind us that schools are organizations, and like any organization, effectiveness does demand a rational articulation among the core components that make up the organization. While random selection from a Chinese menu may create a wonderful lunch, a restructuring process conducted in a similarly random manner is unlikely to create an effective school.[4]

Academic Structure and School Size

In addition to the large effects found in schools where the "restructuring practices" were present, two other findings from this research merit comment.

First, in the larger study which this issue report abstracts, Lee and Smith provide more evidence that a constrained academic structure in high schools plays a key role in the equitable social distribution of achievement. Similar to the findings from *Catholic Schools and the Common Good*, we now have more evidence that disadvantaged students benefit from schools where a greater commonality of advanced academic course work is demanded of all. When high expectations for student learning are embodied in the formal structure of the school and enacted in its daily life, very positive effects can occur for at-risk youth.

Second, and closely related, are the findings in this study about school size. The study provides strong evidence, based on a large representative national sample, that smaller high schools are more engaging environments and produce greater gains in student achievement.

These findings complement and extend a now-large body of research evidence that smaller schools are more productive work places for both adults and students. In these more intimate environments, teachers are more likely to report greater satisfaction with their work, higher levels of morale and greater commitment. Problems of student misconduct, class cutting, absenteeism and dropping out are all less prevalent. We also know that student achievement tends to be more inequitably distributed in bigger schools.[5]

The findings of Lee and Smith are especially important because they focus on grades 9 and 10, precisely the point at which many students disengage from schooling and begin to drop out in large numbers. Smaller schools with more personal environments and a greater commonality of students' academic and social experiences help to engage students in learning and keep them in school. This is powerful evidence arguing for a fundamental restructuring of at least the first two years of high school.

But despite a now-steady stream of results such as these, some locales still continue to build large schools. It is argued that these bigger schools are more efficient, and in a time of fiscal constraint this is viewed as especially important.

The envisioned economies of scale here, however, are actually quite illusive.[6] Moreover, whatever marginal efficiencies may be extracted are dwarfed by the overall ineffectiveness of these institutions. While school districts that are currently saddled with large physical plants might productively move toward schools-within-schools, there is little reason to continue to build more buildings like this. In light of the positive consequences for both adults and students associated with working in small schools, the reality is one of a dis-economy of scale.

While random selection from a Chinese menu may create a wonderful lunch, a restructuring process conducted in a similarly random manner is unlikely to create an effective school.

Anthony S. Bryk is director of both the Center for School Improvement and the Consortium on Chicago School Research at the University of Chicago. He also has been appointed to serve for a year as an advisor to the general superintendent of the Chicago Public Schools, where he will provide input on research, assessment, accountability and policy analysis.

While school districts that are currently saddled with large physical plants might productively move toward schools-within-schools, there is little reason to continue to build more buildings like this.

Caveats

In closing, I would offer two caveats about the results reported by Lee and Smith. First, the NELS test battery consists almost exclusively of standardized multiple-choice items. They are not performance-based assessments. Similarly, the list of restructuring practices extracted from the NELS surveys does not tell us very much about students' exposure to authentic classroom instruction.

In contrast, the field studies being conducted by the Center pay close attention to a classroom's emphasis on higher order thinking skills, students' deep immersion in subject matter, opportunities for substantive conversation and social support for learning. We know little about the prevalence or consequences of such practices from the Lee and Smith study because the NELS data collection was not designed to measure this, and thus NELS is not an appropriate place for the study of these practices.

Lastly, the label "restructuring schools," while convenient for writing purposes, is actually a bit of a misnomer. We do not know from NELS whether these schools are newly restructured or whether the distinctive organization in these schools has been there for some time. Research from the early 1980s indicates, for example, that many of the now-recommended restructuring practices have been commonplace in private schools.

But of particular importance, Lee and Smith found that a significant number of public schools are engaging in these recommended practices, and where this happens, large positive effects for students ensue. This is good news!

Endnotes

[1] See Bryk, A. S., Lee, V. E., & Holland, P. B. (1993). *Catholic schools and the common good*. Cambridge, MA: Harvard University Press.

[2] Chubb, J. E., & Moe, T. M. (1990). *Politics, markets, & America's schools*. Washington, DC: Brookings Institution.

[3] Bryk, A. S., & Driscoll, M. E. (1988). *The high school as community: Contextual influences, and consequences for students and teachers*. Madison: University of Wisconsin-Madison, National Center on Effective Secondary Schools.

[4] See Bryk, A. S., Easton, J. Q., Kerbow, D., Rollow, S. G., & Sebring, P. A. (1993, July). *A view from the elementary schools: The state of reform in Chicago*. Chicago: University of Chicago, The Consortium on Chicago School Research. In this study, we identified a subset of schools that seemed to be approaching school improvements in this fashion. While many new, positive programs and practices were being added, there was little sense of coordination, little attention to constructive implementation and no core vision. We dubbed these places "Christmas tree schools," because these new programs and practices were hung on a tree that, for all practical purposes, was dead!

[5] For a review of the literature in this area, see Lee, V. E., Bryk, A. S., & Smith, J. B. (1993). The organization of effective secondary schools. *Review of Research in Education:* Vol. 19 (pp. 171-268).

[6] For a review of this research, see Bryk, A. S., Lee, V. E., & Smith, J. B. (1990). High school organization and its effects on teachers and students: An interpretive summary of the research. In W. H. Clune & J. F. Witte (Eds.). *Choice and control in American education: Vol. 1. The theory of choice and control in American education*. (pp. 135-226). Philadelphia: Falmer.

SOMEBODY KNOWS MY NAME

By Milbrey W. McLaughlin

At first glance, the strategies Lee and Smith associate with "restructuring practices," students' academic experience and equitable outcomes may appear to have little in common. They concern such seemingly disparate elements of the school environment as student assignment policies, parent relations, course organization and job design.

Yet from another (and usually ignored) perspective–that of the student–they all contribute to the same end: a personalized school setting where teachers are able to know students as learners and as people.

Our experience in a diverse sample of secondary schools suggests, in fact, that when it comes to encouraging student engagement with school and a willingness to work hard to achieve academic goals, the extent to which a secondary school environment is a personal one matters more than any other single factor.

Structures such as those collected here under the rubric "restructuring practices" make a difference in student achievement and engagement when they support personal and sustained connections between students and adults in the school setting, and when they facilitate the sharing of knowledge about students as individuals and learners.

Why do these things matter for student achievement and equity outcomes? Here I offer some important reasons.

Connections

Students' expressions of "invisibility" were chorus and refrain in the majority of the secondary schools we came to know during a five-year research project. "Nobody knows my name." "Nobody cares if I show up or not." "I had to introduce myself to my math teacher at back-to-school night."

Students report a variety of reasons for feeling as outsiders in the school setting. Many come from homes where languages other than English are spoken, where adults have limited or unsuccessful experience with mainstream institutions, or where families, for a variety of reasons, offer little encouragement or support for school success.

Such feelings of anomie and not mattering were voiced especially by students who were not high achievers, or who differed from "traditional" students of yesterday in such terms as culture, language, family circumstances, academic interests and background.

Students told us "the way teachers treat you as a student–or as a person actually," counted more than any other factor in the school setting in determining their attachment to the school, their commitment to the school's goals and, by extension, the academic future they imagined for themselves.

Without a sense of visibility at school, students who weren't attached to conventional academic goals, or who weren't motivated by college competition, too often tuned out or dropped out. One Latina on the verge of dropping out told us, "They didn't really care if you were in the classroom, they didn't care what you were doing. I could have done anything. They had no idea who I was."

Knowledge of Students' Background

Teachers in all of the secondary schools we studied commented that today's students bring different and difficult challenges to the classroom. Further, a significant number of the roughly 900 teachers in our sample said they "didn't know what to do" to be effective with contemporary youth: students whose values, language, academic experience, family supports and home life often differ dramatically from those of students who came to school 15, 10 or even five years ago.

One important key to teachers' success in enabling all students to achieve at high levels was knowledge about these students' families, cultures, and life outside school. Absent this understanding, teachers fail to connect with these students in the ways they did with yesterday's traditional student cohort. Teachers in our

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Without a sense of visibility at school, students who weren't attached to conventional academic goals, or who weren't motivated by college competition, too often tuned out or dropped out.

Milbrey W. McLaughlin is director of the Center for Research on the Context of Teaching and a professor of education and public policy at Stanford University. From 1987 to 1991, the Center carried out a research project involving quantitative and qualitative field data on classroom, school, district and state teaching contexts for approximately 900 teachers working in 16 diverse secondary schools in Michigan and California.

study underscored the need to know what else is going on in a student's life in order to support that student's academic experience.

The pressures, stresses, and demands experienced by many of today's adolescents are largely inconceivable to many adults. "You might find out that the kid goes home and gets beaten every night, or that there might not be enough to eat," said an English teacher, commenting on the need to find out about causes of negative behavior at school. "The point is that because of his environment, he comes to school less equipped," the teacher said. "Should I call him a failure?"

Knowledge About the Learner

Students at all achievement levels told us that they prefer classrooms where they can take an active part in their own learning, classrooms where they can work interactively with their teachers to construct knowledge and understanding. We found these active student roles to be particularly important to the engagement and academic success of non-traditional students, who generally failed to thrive in teacher-dominated classrooms.

In order to move beyond traditional "transmission" teaching, teachers need knowledge about their students' existing understanding of a subject, as well as knowledge about the students' academic (and non-academic) interests. That knowledge helps teachers make relevant connections, and to consider subject matter through the eyes of learners. Without that knowledge, teachers end up teaching to the class as a whole, rather than a roomful of individuals, and they cast students in a passive role.

How Restructuring Practices Help

Each of the "restructuring practices" identified by Lee and Smith contributes in some way to enhancing knowledge about students and enhancing personal connections in the school environment, and thereby to the improved achievement and equity outcomes they report.

Assigning students to the same homeroom over their secondary school career, for example, provides students with an important school "home," where they can establish close and sustained relationships with their teacher and their peers.

Teachers responsible for the same homeroom group throughout high school are able to learn about their students' home lives and their activities and interests away from school, and to observe change in a student's attitudes, behaviors or performance over time. For many students, a consistent homeroom can be a "constant" in an otherwise turbulent life.

Teachers who see students for only a semester or a year, on the other hand, have no benchmark to which either praise or concern can be pegged. Growth often goes unnoticed. So does a student's drop in achievement or engagement with school.

Another example: Emphasis on staff problem-solving provides a critical opportunity for teachers to share knowledge about their students, and to develop a collective sense of responsibility and commitment to all of them. Teachers in three of the secondary schools we studied–schools which were unusually successful in fostering the achievement of nontraditional students–relied on weekly faculty meetings, which began with discussions of specific students, problems and possible responses.

Teachers in these schools pointed to these sessions as essential to their success at reaching their especially challenging students. "The fifth-period science teacher may see something or know something I don't about a kid," said one. "Maybe it's my class that's the problem. Maybe it's more. But if we don't talk I can't find out what's going on, or what things might work better."

School-within-a-school strategies can provide the same shared knowledge and family-like relationships, if they are carried out with these goals as priorities. Smaller school size can help

foster a personalized school environment, but smaller is not necessarily better if strategies to foster personal connections and shared knowledge are not also present. Processes such as weekly faculty meetings, focused on student needs, are critical as well.

Support for Achievement

Parent volunteers can play an important role in helping teachers learn about the cultures, backgrounds and interests of their students. Teachers of students who are new to the United States commented especially on how parent volunteers provide critical information otherwise unavailable to them.

The knowledge generated by these interactions flows both ways. As teachers learn about students and their families, parent volunteers gain important information on how to take a more active role in the school life of their children. Also, students and teachers told us that parent involvement shows students that their families are committed to the school. "These kids see their parents spending time at school, they think it must be important," one teacher said.

Another "restructuring practice," independent study, supports higher levels of achievement and equity in at least three ways. First, it enables teachers to gauge a student's conceptual understanding and subject matter knowledge, and to tailor instruction accordingly. Second, it provides important occasions for teachers and students to develop a personal relationship.

And finally, independent study contributes to higher levels of achievement for all students by letting teachers respond to irregular attendance within their classrooms. This is especially important in classes where large numbers of students are regularly joining and leaving. Individualization, teachers told us, was key to successfully adapting to today's students, and so to achieving the equity outcomes Lee and Smith report.

Teachers also said that cooperative learning strategies, another of the factors identified as a "restructuring practice," allow teachers to attend to individual student needs while keeping the class on track. Cooperative learning strategies, we saw, were effective responses to the high levels of student transience and absenteeism, because the group could take responsibility for keeping individual members informed about class activities.

Students, especially nontraditional students, favor cooperative learning strategies as well, "because if you don't know anybody you're sort of (alone) just doing your work and you're more like...less interested," one student told us. "If you can talk to somebody about it, maybe make comments, it's easier. . . ."

Other "restructuring" elements–interdisciplinary teaching teams, teacher teams with common planning time, mixed ability math and science classes–help enhance student achievement because they generate shared knowledge about students' academic and personal lives, and promote student-centered instruction.

Implications for Practice and Policy

This analysis by Lee and Smith gives critical caution and direction to reformers. Their findings suggest that what matters most about so-called restructuring efforts are the opportunities they provide for creating personalized school environments, settings where teachers and students can come to know one another, and where students feel acknowledged and respected as individuals. Smaller size, or new structures for teacher participation, planning and governance, can facilitate outcomes of higher achievement and greater equity only if they are motivated by a such a vision of school community.

Further, these findings point up the necessary limits of content-based reforms. By itself, the implementation of more challenging, higher-quality academic content will accomplish little if students are not connected to school, and do not take a positive view of themselves as learners.

The "restructuring" strategies identified here are effective because they enable educators and students to forge these connections.

Each of the "restructuring practices" identified by Lee and Smith contributes in some way to enhancing knowledge about students and enhancing personal connections in the school environment, and thereby to the improved achievement and equity outcomes they report.

VIEWS FROM THE FRONT LINE

Three Experienced High School Principals Interpret the Lee and Smith Study

By Leon Lynn

The Lee and Smith study of high-school restructuring will provide important new information–and ammunition–for reformers who are pushing to restructure U.S. high schools.

So say three educators, all with considerable experience as high-school principals, who reviewed the study for the Center on Organization and Restructuring of Schools.

They are:

Richard Olthoff, assistant superintendent for curriculum, instruction and staff development for Minot Public School District No. 1 in Minot, N.D. Before accepting his current position, Olthoff was a high-school principal for 26 years, including 22 years at the helm of Magic City Campus High School, a senior high school in Minot which now has about 1,100 students.

Arthur Lebowitz, director of curriculum for the Phoenix Union High School District in Phoenix, Ariz. He served as a co-principal and principal at South Mountain High School in Phoenix for five years before taking his current job in 1993. During his tenure at South Mountain High, the school's student body grew from 2,500 students to 3,500, and the faculty grew from 210 members to about 300.

Marilyn Hohmann, a senior associate with the Center for Leadership and School Reform in Louisville, Ky. She previously spent eight years as principal of Fairdale High School in Jefferson County, Ky., which serves about 1,200 students, and has been active in the Coalition of Essential Schools reform effort.

The Center asked all three educators to consider these questions:

✔ Why do you think the specific restructuring practices identified by Lee and Smith tend to be associated with achievement gains, as well as a narrowing of the gaps between high SES students and low SES students?

✔ Do these findings suggest any particular implications for high-school principals?

✔ Would you anticipate any different findings between 10th grade and 12th grade?

Personalized Education

The findings reported by Lee and Smith offer guidance to practitioners on numerous important issues, the educators said. And the study is important because it provides possibly the strongest scholarly support for school restructuring yet published. "Those of us who work with the change process need the evidence," Hohmann said.

The Lee and Smith study "lets us point to something and say, 'See? There are some real data-driven reasons why we should continue to restructure,' " Lebowitz said.

The practices that Lee and Smith term "restructuring practices" point toward "a whole new paradigm of instruction" in U.S. high schools, Olthoff said. Schools that employ practices such as mixed ability grouping, cooperative learning, flexible scheduling, team teaching and independent study are better able to deliver a "personalized education" to each student, while helping students build relationships with peers and teachers which help them stay engaged with school. So it makes sense that schools reporting these practices show greater gains in student achievement, he said.

According to Olthoff, the restructuring practices also encourage students and teachers to make "collaborative decisions" about what will be taught in school and how. That helps lead to greater feelings of ownership, autonomy, empowerment and self-esteem for both teachers and students.

Olthoff also suggested that the flexibility created by the "restructuring practices" could help educators devise and deliver more relevant lessons. For example, teacher teams could develop interdisciplinary curriculum that helps students learn to "apply knowledge beyond isolated learning environments," which can help students to develop higher-order thinking skills, he said.

Also, it makes sense that smaller schools posted greater student gains, Olthoff said, "because a personalized education can more easily happen in smaller settings." The Lee and Smith study provides strong evidence for building smaller schools, or moving larger schools to the school-within-a-school format, "and if I were a principal in a big school... and this study crossed my desk, before I did anything else I would absolutely have to talk to somebody about that," he said.

The findings reported by Lee and Smith offer guidance to practitioners on numerous important issues, the educators said. And the study is important because it provides possibly the strongest scholarly support for school restructuring yet published.

Focusing Reform

Lebowitz noted that the study indicates that schools adopting a large number of reforms at one time didn't post achievement gains that were significantly greater than those posted by schools trying fewer reforms. That jibes with his experience heading a school where well-intended reformers "tried to throw in everything at once, including the kitchen sink....There were no data to point the way, to tell us this might not be the best way to go." The Lee and Smith study will hopefully encourage schools to try a few carefully chosen, well-supported reforms at one time, instead of launching a wide variety of reform programs all at once, he said.

Lee and Smith also present significant evidence for developing a "focused curriculum" at grades 9 and 10, in which students would have fewer courses to choose from and all courses would call for high levels of student achievement, Lebowitz said. "Here we have evidence that suggests giving students plenty of options might be counterproductive to student outcomes and success." If those findings are borne out by additional research, they could have powerful implications for how schools should decide what courses to offer, he said.

Influences on Student Achievement

Lebowitz said he couldn't predict whether the types of student gains Lee and Smith noted in grades 9 and 10 will also be found in future studies that follow those students through grades 11 and 12. Life becomes more complicated at the higher grade levels, both in school–where course offerings are often more extensive and the pressure to make choices and to begin pursuing a particular career path are stronger–and outside the school environment, he said. New social expectations, such as the pressure to immediately begin earning a living, affect students in 11th and 12th grades "more immediately," often making it harder for them to stay in school and stay focused on academic work.

But at the same time, students in the more advanced grades "are that much closer to graduation, and taking that next step, whether it's college or work, is a lot more real for them," which can be a powerful incentive to stay in school and work hard, he said.

Many of these positive and negative influences on student achievement and engagement in grades 11 and 12 are beyond the influence of what happens in the school setting, Lebowitz said. "It's my personal opinion that restructuring has less emphasis the older (students) get."

Hohmann was a bit more optimistic on the impact high-school restructuring could have on juniors and seniors. She suggested that students could continue to post greater academic gains in those grades, as long as the same reform principles that shaped their experience in grades 9 and 10 continue to shape their school experience. For example, students who gained in smaller academic environments during 9th and 10th grade would probably benefit in grades 11 and 12 as well, as long as their schools continued to address "that terrible size business" in those grades, she said.

Resistance to Restructuring

But it's clearly much tougher to make significant changes in the way a high school works at grades 11 and 12 than in grades 9 and 10, Hohmann said. That's due in part to the different academic challenges facing students at the higher grade levels. But frequently, it's also rooted in the intransigence of teachers working at those higher grade levels.

"They often see themselves as preparing kids for college, and that's it. They can't see the broader implications of preparing kids for a variety of choices," she said. For example, a calculus teacher might see calculus as "an esoteric discipline unto itself," without seeing math "as a tool of logic and communication" that could shape the way a student perceives the world at large and processes information from a variety of sources, she said.

While teacher education programs, peer counseling, common planning time and similar reforms can provide teachers with good information and encourage them to embrace the "big picture," Hohmann said she has encountered many teachers who simply refuse to change their practices or expectations.

Parents also resist efforts at restructuring schools, Hohmann said, especially the parents of students who are already successful in unrestructured schools. She recalled dealing with many parents who resisted any reforms aimed at improving school equity, because "they couldn't believe that other kids could improve and show gains without it somehow hurting their kids." For example, the parents of already-successful students might resist mixed-ability grouping, fearing their children will be dragged down by being put in a class with students who aren't as successful, she said.

Students do better in schools that "are really learning about their kids, getting to know them well, knowing their learning styles and their personal situations," Hohmann said.

FROM KNOWLEDGE TO UNDERSTANDING

By Fred M. Newmann and Gary G. Wehlage

We hear from many sources that a major goal of school restructuing is to transform education from the transmission of knowledge to the development of understanding. Instead of learning only to recite facts and definitions and to follow rules, students should learn to make sense of, interpret and use such knowledge to solve unanticipated problems.

Since early in 1994, when Lee and Smith first reported their astonishing findings to staff members at the Center on Organization and Restructuring of Schools, we have been trying to make sense of this new knowledge about school restructuring. We hope this Issue Report will stimulate a rigorous search for explanations to the question which still puzzles many of us: Why do schools that report any three or more of the 12 practices listed in Table 1 outperform other schools, both in students' achievement gains and in the equitable distribution of these gains across socio-economic categories?

Looking at the Data

As indicated by the principals interviewed here, the new knowledge that "restructuring works" offers important support to thousands of dedicated people working to restructure their schools. We welcome the good news and congratulate schools that have achieved success.

But to understand the news of the Lee and Smith study, at least two points must be emphasized.

First, the schools with restructured practices demonstrated impressive results compared to other schools, but the data do not indicate how well students have done in relation to a clear standard of what students know and can do. Statistical manipulation of the test scores makes it difficult interpret the kind and level of academic mastery that has been gained, or whether even the most impressive gains are "good enough." Results on the National Assessment of Educational Progress suggest that even schools that post impressive gains compared to others may still score relatively low compared to a fixed standard of excellence.

Second, unless we move beyond this knowledge to a clearer understanding of how and why such restructured practices might be statistically associated with improved achievement outcomes, we risk putting lots of effort into changes that, in spite of their appearance in Figure 1, may have no beneficial effects in many schools.

Colleagues Lee, Smith, Bryk and McLaughlin agree that these "restructuring practices" alone don't directly "cause" these achievement gains or their more equitable distribution. Instead, the practices probably reflect or make possible a more fundamental communitarian ethos in which personalized caring for all students produces the effects.

But why are organizations of this sort likely to improve both achievement and its equitable distribution? Our best explanation is that in communitarian, more personalized schools, staff and students alike presumably try harder to achieve the organization's learning goals for all students.

To be sure, this advances understanding, but the puzzle is not yet solved. We think that communitarian, personalized schools are necessary, but certainly not sufficient for substantially enhancing academic achievement or maximizing its equitable distribution. We have studied secondary school pro-

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grams where dedicated staff have organized themselves into teams or families that work with small numbers of students, taking responsibility for most of their instruction each day and, in some cases, staying with the same group for two years or more. These programs build personal bonding between students and staff and often show impressive success keeping potential dropouts in school, involving them in productive workplace experience and in building self esteem. In several such programs, however, students' academic achievement falls short, because staff in the program, fearing that students might resist or drop out, are reluctant to insist on high academic performance.

Curriculum and Standards

A fuller explanation of gains in student achievement requires us to consider the intellectual substance of curriculum and instruction delivered to students. To explain the distribution of achievement among different socioeconomic groups, we should examine how expectations for and assistance in mastering the intellectual substance of the curriculum are distributed among the different groups.

In short, we think that in addition to an environment which encourages all students to try hard, students must have teachers who concentrate consistently on high quality curriculum and instruction, and who make special efforts to see that students from economically disadvantaged backgrounds succeed in meeting high intellectual standards.

Is there reason to believe that schools which reported any three or more of the "restructuring practices" in Figure 1 are more likely than other schools to offer high quality curriculum and high intellectual expectations for low SES students? We see no apparent ways in which those restructured practices are more likely to produce high quality curriculum and instruction than many other practices listed in Figure 1. However, it's possible that the explanation works in the reverse direction.

That is, teachers inclined to concentrate on high quality curriculum and instruction–and to make special efforts for all students to succeed–may believe restructured practices are necessary to implement their commitment to intellectual quality. These teachers may press for changes and, in many cases, they may find supportive administrators in the school and district who lend legitimacy and resources to the teachers' initiatives. Instead of structural innovations leading to changes in teacher and student behavior, perhaps the teachers' competence and professional commitments to high intellectual quality for all students push these schools to adopt organizational features such as those in Figure 1.

This alternative explanation is probably also insufficient, but it is especially worth considering, because it is consistent with other evidence that shows two important things: the importance of the specific educational content and expectations that teachers communicate to students; and that organizational structures alone yield few predictable effects.

Explanations of this sort could be pursued further by examining student and teacher reports of curriculum standards and teacher expectations in the NELS data set. The Center's study of 24 "restructured" schools will also examine how the intellectual quality of students' education and the schools' structural practices affect student achievement.

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students observed in this study, by looking at the same students' performance as high school seniors.

Nevertheless, the findings indicate that something positive is happening to students in schools defined here as restructuring. This seems to suggest that a school could benefit from adopting and sustaining a modest number of these reform strategies, preferably strategies aimed at moving schools toward a more communal structure and away from the bureaucratic form.

The findings also suggest that making high schools smaller will benefit students. It is unlikely that the public would support building many new, smaller schools, but alternatives need to be considered.

One promising concept is the school-within-a-school, which seeks to re-create the dynamics of several small schools within the framework of a more typical large high school. These are already in place in about 15 percent of U.S. high schools. If these units can successfully avoid specialization, and other characteristics of the bureaucratic model or organization, they hold considerable promise.

Endnotes

[1] See Bryk, A. S., & Driscoll, M. E. (1988). *The high school as community: Contextual influences, and consequences for students and teachers*. Madison, WI: National Center on Effective Secondary Schools. We are indebted to Bryk and Driscoll for developing the conceptual framework for contrasting the different types of schools, and laying the theoretical groundwork for the current study.

[2] Newmann, F. M. (1991). What is a 'restructured' school? A framework to clarify means and ends. *Issues in Restructuring Schools*, No. 1, 3-5, 16. Madison, WI: Center on Organization and Restructuring of Schools.

[3] See Bryk & Driscoll, op. cit.

STUDY CHARACTERISTICS AND RESEARCH METHODS

This study of the effects of restructuring on high-school students is based on data collected as part of the National Education Longitudinal Study (NELS) in 1988 and 1990.

NELS identified a random sample of about 25 students enrolled during 1988 in 8th-grade classes at each of roughly 1,000 middle schools nationwide–about 22,000 students in all. Using data collected from the same students in 1990, the study traced as many of these students as possible to high school.

The student sample was filtered further by including only students for whom we could obtain full test score data in both the 8th-grade and 10th-grade years. Students in the sample also had to be enrolled in schools for which data from high schools and teachers was available. The final sample was refined to 11,794 high school sophomores.

We examined the achievement gains made by these students in four areas–math, science, social studies and reading–from 8th grade to 10th grade. These gains were measured as the differences between scores on the same short, multiple-choice tests administered through NELS at the end of the 8th and 10th grade. The tests were composed of items drawn from the National Assessment of Educational Progress. We also estimated change in students' engagement, measured by NELS as the extent to which they felt challenged and worked hard in high-school classes in each of the four areas tested.

The schools in the study included public, Catholic and elite private secondary schools. To be included in our sample, each school had to have at least five NELS students enrolled. The final school sample included 717 public high schools, 54 Catholic high schools and 49 elite private schools.

Using data from the NELS study, usually supplied by the school principal, we developed a list of 30 practices that identified the school's efforts at reform. We designated these practices as traditional, moderate or restructuring, based on how great a deviation from standard practice each of them represented, and how they met the criteria for restructuring developed by the Center on Organization and Restructuring of Schools.

By these standards, practices that support reform toward a more communal structure, and that are least common, were most likely to be classified as restructuring. Practices that adhere to the more common or bureaucratic model of school organization fell into the traditional or moderate categories (see Figure 1 on page 3 for a list of all 30 practices).

To analyze the data and draw conclusions about the effects of restructuring on student gains in achievement and engagement, we used a statistical procedure known as Hierarchical Linear Modeling (HLM). This procedure allowed us to analyze the data to estimate performance and equity differences between students within a school, as well as differences between schools.

In order to accurately measure the effects of the factors we wished to study, we used statistical controls to eliminate the influences of other factors that can have an impact on student performance. When looking at individual students, we controlled for socioeconomic status, minority status, gender, and differences in student engagement and academic achievement before reaching high school.

At the school level, we controlled for average school socioeconomic status, minority concentration and degree of academic emphasis (based on the average number of math and science courses students took during their 9th-grade and 10th-grade years), and the degree to which different students take different courses within each grade.

RESEARCH PAPER AVAILABLE

The Wisconsin Center for Education Research is distributing copies of the complete research paper by Valerie Lee and Julia Smith, *"Effects of High School Restructuring and Size on Gains in Achievement and Engagement for Early Secondary School Students,"* which is summarized in this issue report.

The complete paper includes a more detailed description of the study's research methods and findings, including full references to more than 70 relevant articles and publications.

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CENTER MISSION

The Center on Organization and Restructuring of Schools studies how organizational features of schools can be changed to increase the intellectual and social competence of students. The five-year program of research focuses on restructuring in four areas: the experiences of students in school; the professional life of teachers; the governance, management and leadership of schools; and the coordination of community resources to better serve educationally disadvantaged students.

Through syntheses of previous research, analyses of existing data and new empirical studies of education reform, the Center focuses on six critical issues for elementary, middle and high schools: How can schooling nurture authentic forms of student achievement? How can schooling enhance educational equity? How can decentralization and local empowerment be constructively developed? How can schools be transformed into communities of learning? How can change be approached through thoughtful dialogue and support rather than coercion and regulation? How can the focus on student outcomes be shaped to serve these principles?

CENTER PUBLICATIONS

In the fall and spring of each year, the Center publishes an issue report offering in-depth analysis of critical issues in school restructuring, which is distributed free to everyone on the mailing list. In addition, three briefs targeted to special audiences are offered yearly. Our bibliography is updated each year and is distributed free on request. Occasional papers reporting results of Center research are available at cost. To be placed on the mailing list and receive *Issues in Restructuring Schools*, please contact Leon Lynn, Dissemination Coordinator, Center on Organization and Restructuring of Schools, University of Wisconsin–Madison, 1025 W. Johnson Street, Madison, WI 53706. Telephone: (608) 263-7575.

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High School Restructuring and Student Achievement

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